of the method of computation which is used for an updraft furnace.

From a reheating furnace at the Lougansk works (Russia) the products of combustion, at a temperature of 600°, pass to a boiler by an outlet port in the roof. The volume of these gases, based upon the actual coal consumption per second, is computed as being equal to \$500 = 8 m^3 58 per second, with an air supply equal to one and one-half times the theoretical amount required. The port in the roof of the furnace had a section of 2.5X0.6= 1 m^2 50. With these conditions fixed, at what distance below the roof will the free surface of the layer of gases in the furnace be located?

$$8.58 = KHC2\sqrt{2gH\frac{\Delta_{air}-\Delta_{gas}}{\Delta_{gas}}}$$

$$1.5\sqrt{2gH\frac{1.29-\frac{1.33}{1+\frac{800}{273}}}{\frac{1.33}{1+\frac{800}{273}}}}$$

Assuming /ci/c2 = l, *V2g = 4A3,* it will be found that

And therefore, according to these calculations, the distance from the free lower surface of the gas layer to the port, in the case of the gases flowing into the air, would be 896 mm. In the furnace this distance actually was 800 mm.

This shows that the designers of this furnace had taken into account a very old rule which says that if a reverbatory furnace is to work well, the flame must KcA the hearth of the furnace. The height of 896 mm not only assures the contact of the flame with the sole of the furnace, but also permits, by the increase or diminution of the draft through the boiler, of the regulation of the thickness of the gaseous current; that is to say, it provides a means of drawing the flame up from the hearth or of forcing it down against it.

Although the above computation has already been given, it is repeated here that the port for the waste gases should never be placed in the roof of the furnace. It is a bad system and one that is now out of date. In the operation of those furnaces where